PUERTO RICO'S COMMERCIAL MARINE FISHERIES
A Statistical Picture

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Puerto Rico's fishing industry presents a great contrast: it has a modern, productive, and highly capitalized tuna fleet--and an inshore fishery that has not changed substantially in several generations.

We began to evaluate the inshore marine fisheries, using statistical information, in June 1967. It was part of the Fisheries Research and Development Program cosponsored by the U.S. Department of the Interior and the Department of Agriculture, Commonwealth of Puerto Rico. The University of Miami's School of Marine and Atmospheric Sciences was technical adviser from July 1967 through June 1969. The program was authorized under Commercial Fisheries Research and Development Act of 1964 (PL 88-309).

The main objective is to establish a system for obtaining data on landings and sales of fish and shellfish in Puerto Rico's inshore fisheries. The system will assist the local fishing industry--and fill the statistical needs of the Bureau of Commercial Fisheries and other interested agencies. Statistical data include number and types of fishing craft and gear, and number of fishermen.

This article presents the results of our work in 1968-1969.

FISH & SHELLFISH LANDINGS, 1968-1969

Currently, the information gathered through the sale tickets system is coming directly or indirectly from many fishermen. In my opinion, at least 70% of total landings are

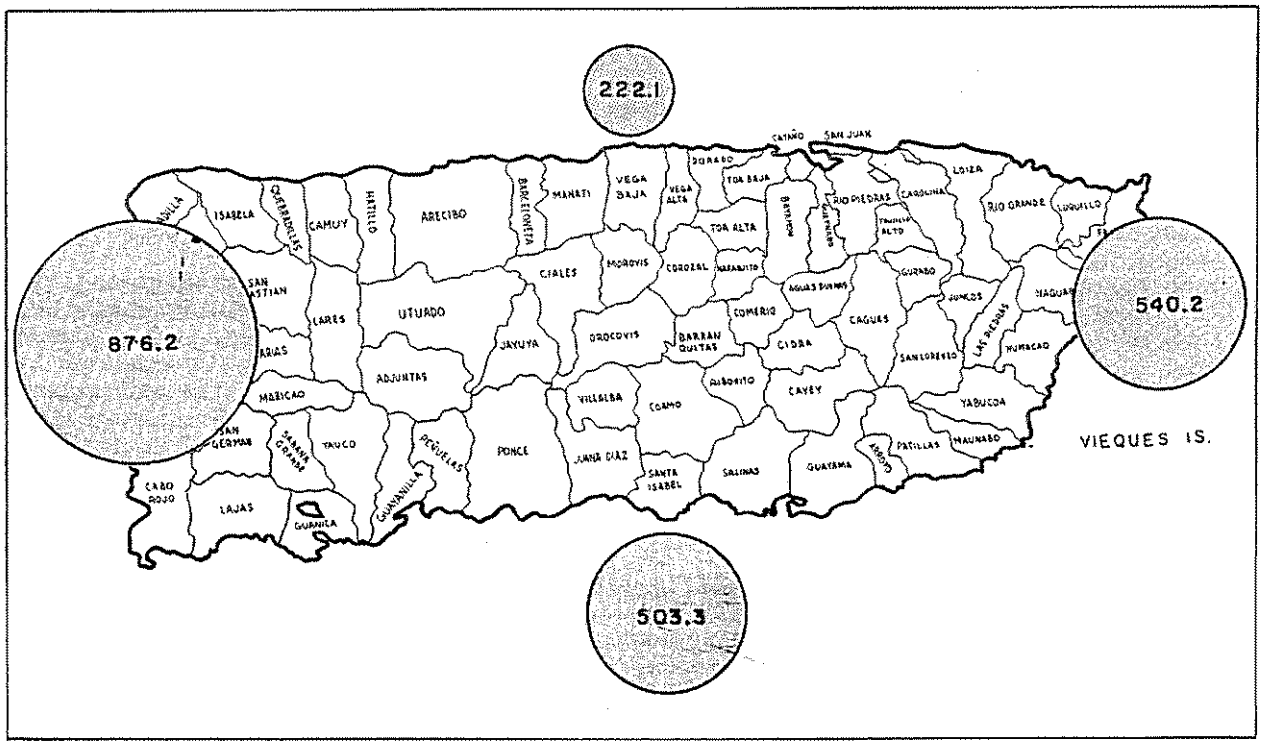

Fig. 1 - Reported landings from inshore commercial fisheries (in 1,000 lbs.) by coastal regions, Oct. 1967-Oct. 1969.

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being collected by this method. However, a very important goal of our project is to determine this percentage with greater accuracy.

Distribution of Landings

Production is highest on the west coast of island and lowest on the north coast (Figs. 1 & 2). Since statistical program was started in October 1967, Cabo Rojo alone has produced consistently nearly 30% of the island's reported landings of fish and shellfish--and about 23% of exvessel value.

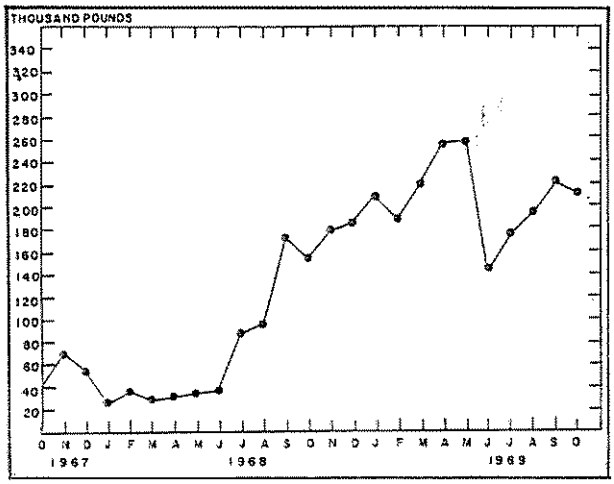

Fig. 2 - Reported landings of fish and shellfish from coastal waters, Oct. 1967 through Oct. 1969.

After Cabo Rojo, the more productive fishing centers were Vieques Island and Fajardo (east coast), Guanica and Lajas (south west coast), Aguadilla and Mayaquez (west coast), and Naguabo and Humacao (east coast). Cabo Rojo and the above areas together produce 66% of Puerto Rico's total reported production.

The average price paid to fishermen, for fish and shellfish combined, July 1968-June 1969, was 28 cents. The lowest (23 cents) was recorded on the west coast; the highest (38 cents) on north coast.

Fish represent 87.6% of the weight (Fig. 3) and 73% of the exvessel value of the landings. Of the shellfish, spiny lobster (including some sand lobsters) was most abundant--8.4% by weight and 22% by value. It also brings the highest exvessel price per pound (74 cents) of any fish and shellfish; land crab is close behind at 64 cents per pound. The remaining 4% of landings were other shellfish and turtle. These values represent averages for the island, but price per pound varies regionally.

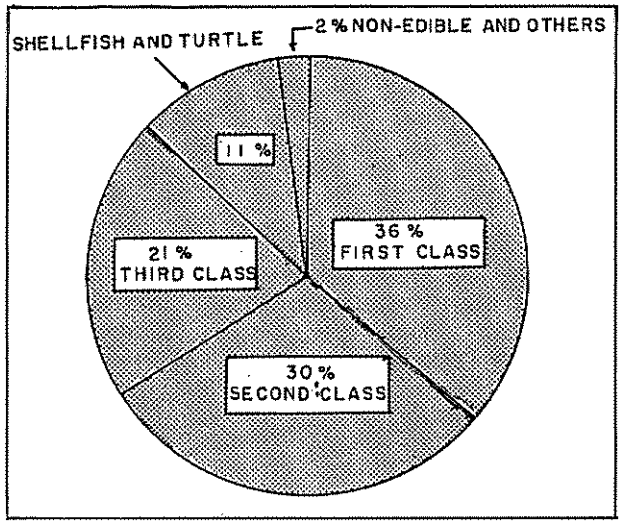

Fig. 3 - Distribution of marketing classes of fish and shellfish reported from coastal waters, July 1968-June 1969.

Information is available for the past two years, but reliable data are not. It is difficult and premature to try to make accurate estimates of annual production and seasonal variation. If magnitude of reported landings of previous years is compared with July 1968-May 1969 data, it can be concluded that figures have increased steadily since July 1968 (Fig. 2). However, it is still questionable whether this increase represents part of a seasonal cycle of availability of fish and shellfish--or simply an improvement in data acquisition, or both.

Composition of Catch

Accurate information on catch composition is extremely difficult to obtain because of the diversity of species in the catches and the lack of fish-landing records kept by fish dealers and fishermen. The author has seen 15 to 20 species in one catch. However, during 1969, the statistical agents gathered much information on composition by species.

In Puerto Rico's coastal waters, there are roughly 130 species of commercially important fish, including all market classes. About 30 are first class, but the most common are: hogfish, Lachnolaimus maximus; king mackerel, Scomberomorus cavalla; trunk-fishes, Lactophrys spp.; Nassau grouper, Epinephelus striatus; silk snapper, Lutjanus vivanus; yellowtail snapper, Ocyurus chrysurus; dolphin, Coryphaena hippurus; yellowfin grouper, Mycteroperca venenosa; mysty grouper, Epinephelus mystacinus; blackfin snapper, Lutjanus buccanella; wahoo, Acanthocybium

solandri; barracuda, Sphyraena barracuda; snook, Centropomus undecimalis, and mutton snapper, Lutjanus analis.

The most common classified fish are: snapper (35%), mackerels (28%), and groupers (12%).

Shellfish are represented mainly by 74% spiny lobster, Panulirus argus; 11% conch, Strombus gigas; 8% sea turtles, Eretmochelys imbricata, Caretta caretta, Chelonia mydas and Dermochelys coriacea; 5% octopus, Octopus vulgaris; and 2% land crab, Cardisoma quanhumi.

FISHERMEN, CRAFT, AND GEAR

At every fishing center, the number of fishermen, craft, and gear was surveyed during April-Sept. 1969.

The total number of fishermen was determined on the basis of information in 2,131 fishing license applications for fiscal year 1968-1969. Interviews were based on three main questions: fisherman's status (regular, casual, deckhand), type of boat (name, registration number, propulsion, dimensions), and type of gear (number, quantity).

There were 991 fishermen: regular, casual, and deckhand (regular or casual). A regular fisherman receives at least 50% of income from fishing, or spends half his working time at it. There were 787 fishing boats (motor and other).

On the entire island, 38% of the fishermen were regular, 62% casual. Most fishermen were boat owners: 80% of regular, and 69% of casual.

The distribution of regular fishermen by region is significant. The west coast, most productive area, had highest number (34%). The lowest number (15%) was on north coast, lowest production area.

Of fishing craft, 76% are boat-motor, and 24% boat-other (sail, row, motor and sail). The highest number of motor boats are on the south coast (33%), followed by east (25%), north (23%), and west coast (19%).

A few fishing boats are driven by sail or motor and sail (Fig. 4). Sail boats are 3% of

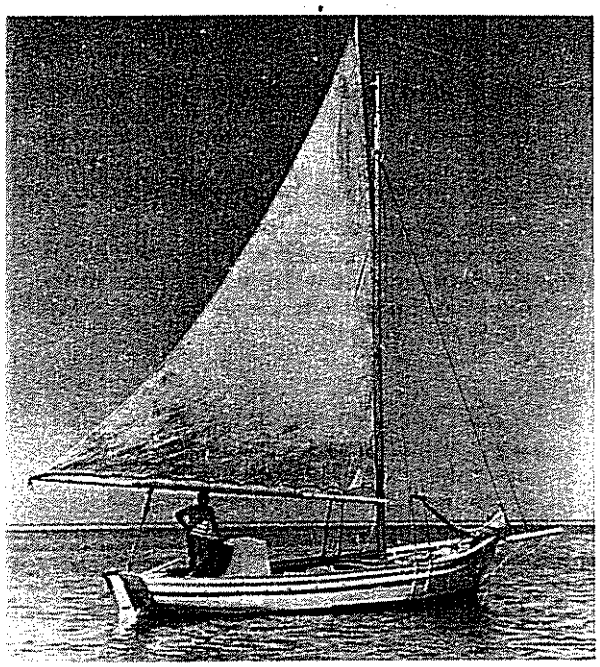

Fig. 4 - Twenty-seven-foot motor and sail fishing boat at El Combate, Cabo Rojo.

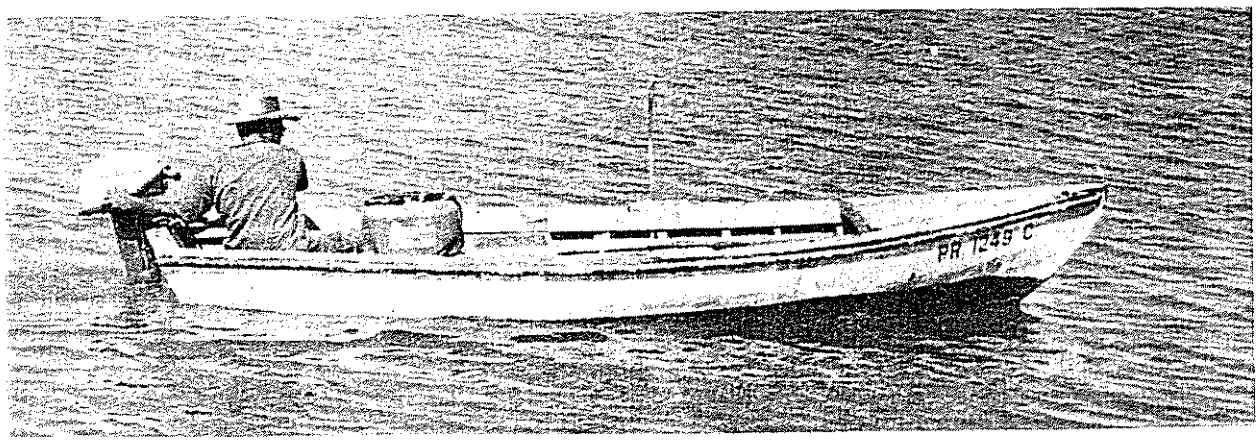

Fig. 5 - Sixteen-foot outboard motor fishing boat called "yola" is the most popular fishing craft.

boat-other, and motor and sail only 11%. Row boats are about 85%: the highest number in the north coast (38%), followed by west (30%), east (18%), and south (14%) coasts.

The most popular commercial fishing boat is the "yola" (Fig. 5). It is largely a flat-bottom skiff of the dory type, small, roughly constructed, and with a restricted cruising range. About 57% of all fishing boats are 16 to 18 feet long. The most common mode of propulsion is the outboard motor, 6 to 10 horsepower (38%).

In Sept. 1969, inshore fishing gear of all types totaled 12,125 units, divided as follows:

Fish pot (62.8%): most common. It is generally arrow-head shaped, with one downward curving entry funnel at apex. This funnel is tapered to prevent escape of the catch (fig. 6). The pot is about 5 feet long, 5 feet wide, and 1.5 feet high; it is constructed of mangrove pole frames and galvanized chicken wire. It is fished as single unit with a separate buoy line or several buoys attached to one main line.

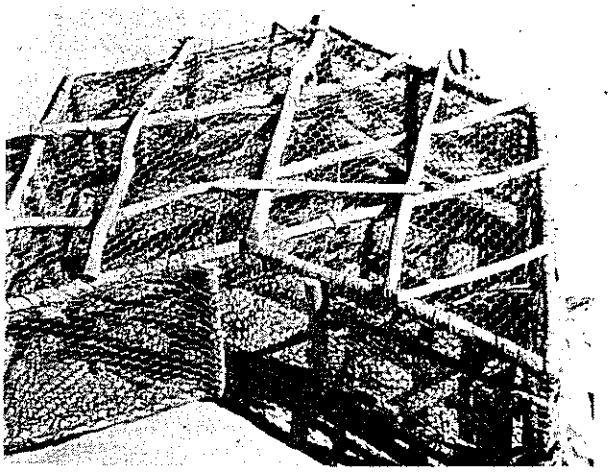

Fig. 6 - Conventional fishing pot at El Combate, Cabo Rojo.

Troll line (9%): a long single line, with one or more barbed hooks at free end of line, baited with either natural or artificial lure, and towed behind moving boat (fig. 7).

Hand line (6.2%): a single line with one or more hooks held or attended by one fisherman. At end of line, 4, 6, or 8 hooks are hung from a hard frame of galvanized wire ("ballestilla"), with 3- to 5-lb. lead attached to center (fig. 8).

Fig. 7 - Troll line with spoon used at La Puntilla, Cataño.

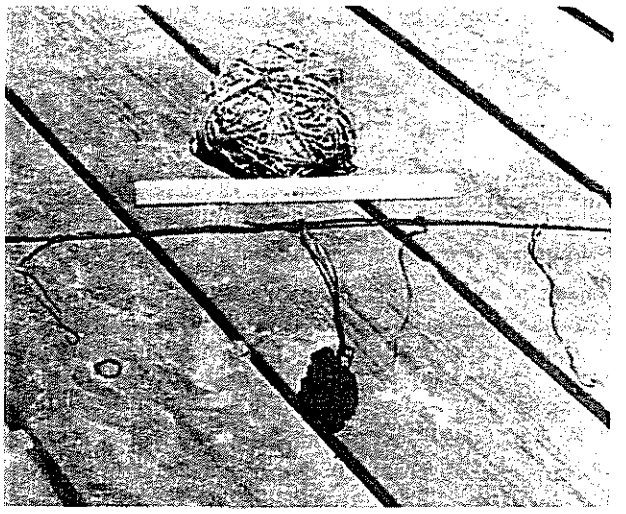

Fig. 8 - Hand line for fishing silk snapper at El Combate, Cabo Rojo.

Spiny lobster pot ("cajon," 5.3%): restricted to a few fishing centers. Various designs and dimensions resembling fish pots described before (fig. 9). One type is made of galvanized chicken wire and mangrove poles. Typical Florida-type wooden lobster pots have been introduced in recent years. About 32 inches long, 25 inches wide, 16 inches high, they are constructed of precut cypress slats and 1 x 1 inch strips of pine or spruce (fig. 10).

Cast net (4.7%): Almost every fisherman has one cast net ("Atarraya") for catching small bait fish. It is a circular, cone-shaped, 6-15-foot diameter net thrown by hand to trap fish. The leads on net's outer edge sink

rapidly to bottom, entrapping fish. The net is then recovered by slowly pulling the recovery line attached to its center.

Turtle net (4.6%): a special type of gill net ("volante" or "chinchorro de carey") for catching sea turtles. A single wall of net 4 to 6 yards deep by 20 to 80 yards long; mesh is 20 to 24 inches, stretched measure.

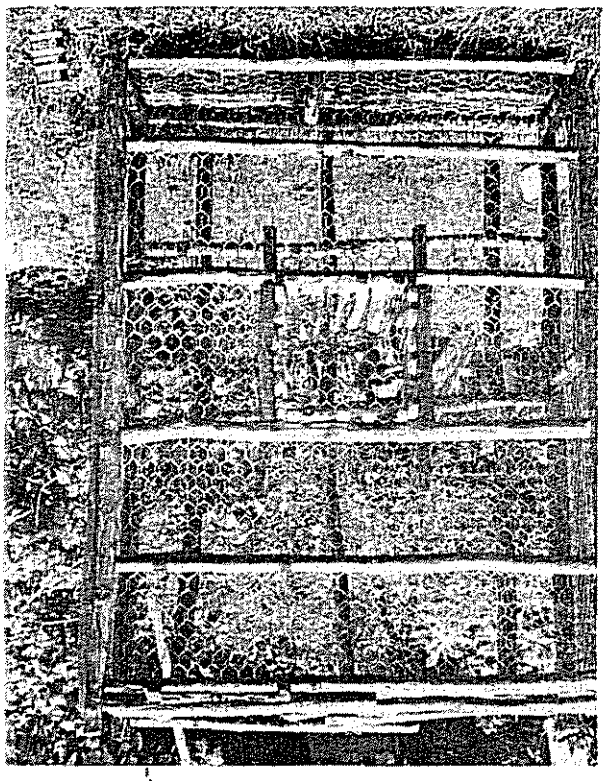

Fig. 9 - Spiny lobster fishing pot at Las Croabas, Fajardo.

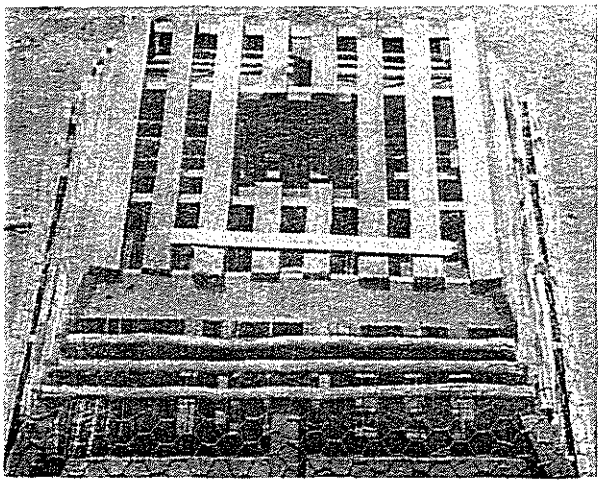

Fig. 10 - Florida-type spiny lobster fishing pot used at Camino Nuevo, Yabucoa.

Gill net (3%): common on north coast. It is a fence of fiber webbing (fig. 11) in which fish are caught (gilled) in net's meshes. Sizes of mesh depend on species and size of fish sought. Its height and length are also variable. Several types used, such as bottom and surface gill net ("trasmallo" or "filete"), and trammel net ("mallorquin").

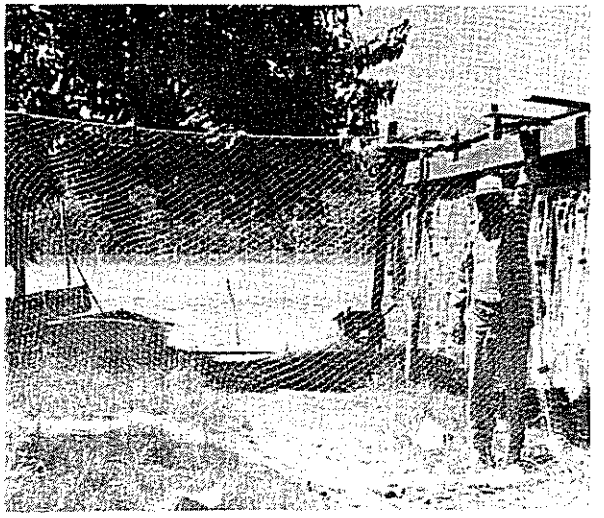

Fig. 11 - Six hundred yards length by four yards length by four yards depth gill net used by fishermen at Puerto Real, Fajardo.

Trot line (1.4%): this type ("palangre") is a long fishing line with series of baited hooks on short, separate, branch lines (fig. 12). It can be anchored or left drifting, and requires only periodic attention.

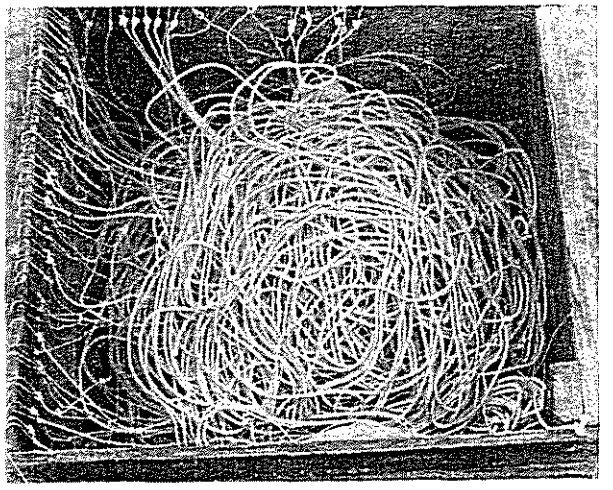

Fig. 12 - One hundred hooks trot line gear for bottom fishing at Puerto Real, Cabo Rojo.

Spear (1%): has limited use in inshore commercial fisheries. Generally, the spear ("fisga") is used by fishermen with a diving outfit. They catch mainly lobster or big fish.

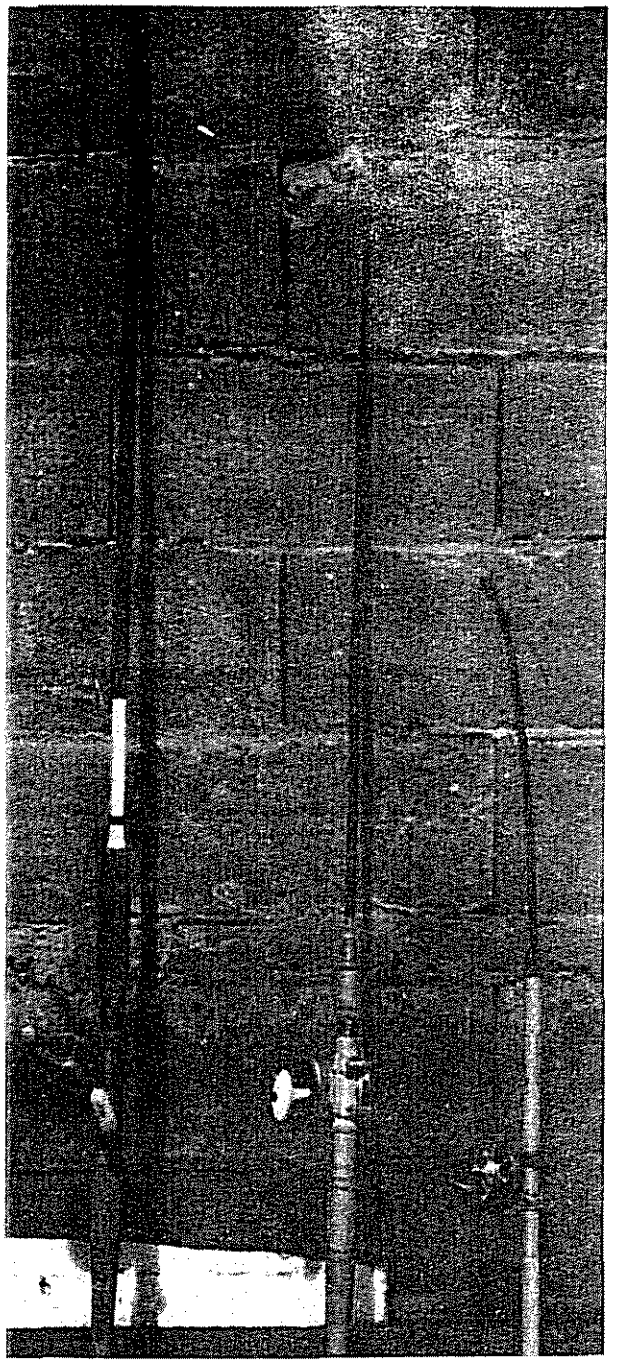

Fig. 13 - Different types of pole and lines used at La Puntilla, Cataño.

Haul seine (0.9%): an encircling type of net made of mesh webbing and with two wings and a bag. Top line has floats to keep it at surface, while bottom or foot line is weighted. Bag is flanked by wings, to which auxiliary lines are attached. A haul seine ("chinchorro") generally is set from row boat and hauled to the shore line, or to beach, by 8 to 10 auxiliary fishermen.

Pole and line (0.5%): utilized principally by sport fishermen. A few commercial fishermen use it occasionally (fig. 13).

'Others,' the hand reel (0.2%): It holds about 1,500 feet of $\frac{3}{64}$ stainless steel stranded cable; 4 to 6 circle hooks sizes 7, 8, and 9 are fished from each line. Hand reels have been reported only from Salinas and Vieques Island. Deep-water fishes--snappers and groupers--are caught with it. Sometimes a home-made imitation of conventional hand reel (fig. 14) is used.

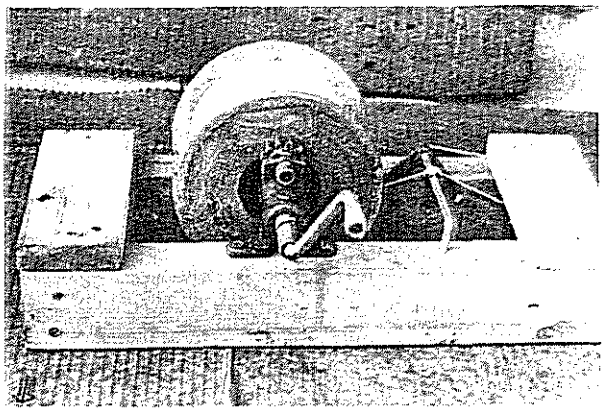

Fig. 14 - Hand made hand reel for deep fishing at La Puntilla, Cataño.

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